

SEMICONDUCTOR PACKAGE HAVING A THERMALLY AND ELECTRICALLY CONNECTED HEATSPREADER

5

ABSTRACT OF THE DISCLOSURE

Embodiments of the invention include a semiconductor integrated circuit
10 package that includes a substrate having an integrated circuit die attached thereto.
The substrate includes at least one electrical ground plane and includes a plurality
solder balls formed on a surface thereof. The solder balls include a set of
“thermal” solder balls that are positioned near the perimeter of the package and
electrically connected with a ground plane of the package. The IC die is
15 electrically connected with the ground plane that is connected with the “thermal”
solder balls. A heat spreader is mounted on the package with conductive
mounting pegs that are electrically connected with the ground plane. The heat
spreader is in thermal communication with the die and also in thermal
communication with the set of “thermal” solder balls. This configuration enables
20 a portion of the heat generated by the die to be dissipated from the die through the
heat spreader into the set of “thermal” solder balls. Additionally, the package can
be configured so that the combination of the electrically connected heat spreader,
ground plane, and conductive mounting pegs operate together as a
electromagnetic shield that reduces the amount of electrical noise of the package.